WHAT IS CLAIMED IS:

1. A method for depositing a dielectric film on a substrate in a process chamber, the method comprising:

(a) providing a first gaseous mixture to the process chamber, the first gaseous mixture comprising a first deposition gas and a first inert gas source;

(b) generating a first high-density plasma from the first gaseous mixture to deposit a first portion of the film on the substrate with a first deposition/sputter ratio within the range of 5 – 20, wherein the first deposition/sputter ratio is defined as a ratio of a sum of a first net deposition rate and a first blanket sputtering rate to the first blanket sputtering rate;

(c) thereafter, cooling the substrate;

(d) thereafter, flowing an etchant gas into the process chamber;

(e) thereafter, providing a second gaseous mixture to the process chamber, the second gaseous mixture comprising a second deposition gas and a second inert gas source; and

(f) generating a second high-density plasma from the second gaseous mixture to deposit a second portion of the film on the substrate.

2. The method according to claim 1 wherein the second gaseous mixture is substantially the same as the first gaseous mixture.

3. The method according to claim 1 wherein the deposition/sputter ratio is in the range of 9 – 15.

4. The method according to claim 1 wherein the step of generating a second high-density plasma is performed with a second deposition/sputter ratio within the range of 5 – 20, wherein the second deposition/sputter ratio is defined as a ratio of a sum of a second net deposition rate and a second blanket sputtering rate to the second blanket sputtering rate.

5. The method according to claim 4 wherein the second deposition/sputter ratio is less than the first deposition/sputter ratio.

6. The method according to claim 1 wherein the etchant gas comprises remotely dissociated etchant atoms.

7. The method according to claim 6 wherein the remotely dissociated etchant atoms comprise fluorine atoms.

8. The method according to claim 7 wherein the fluorine atoms are provided by NF_3.

9. The method according to claim 1 further comprising the step of dissociating the etchant gas into dissociated etchant atoms within the process chamber.

10. The method according to claim 9 wherin the etchant gas is a fluorine-containing gas.

11. The method according to claim 9 wherein the etchant gas is NF_3.

12. The method according to claim 1 wherein the dielectric film is a silicon oxide film.

13. The method according to claim 1 wherein the dielectric film is a fluorinated silicon oxide film.

14. The method according to claim 1 wherein the dielectric film is deposited over a plurality of stepped surfaces formed on the substrate having gaps formed between adjacent ones of the stepped surfaces and wherein the first portion of the film partially fills the gaps.

15. The method according to claim 14 wherein the second portion of the film completes filling the gaps.

16. The method according to claim 1 wherein the step of cooling the substrate is performed external to the process chamber.

17. A computer-readable storage medium having a computer-readable program embodied therein for directing operation of a substrate processing system including a process chamber; a plasma generation system; a substrate holder; and a gas delivery system configured to introduce gases into the process chamber, the computer-readable program including instructions for operating the substrate processing system to

deposit a dielectric film on a substrate disposed in the process chamber in accordance with the following:

(a) providing a first gaseous mixture to the process chamber, the first gaseous mixture comprising a first deposition gas and a first inert gas source;

(b) generating a first high-density plasma from the first gaseous mixture to deposit a first portion of the film on the substrate with a first deposition/sputter ratio within the range of 5 – 12, wherein the first deposition/sputter ratio is defined as a ratio of a sum of a first net deposition rate and a first blanket sputtering rate to the first blanket sputtering rate;

(c) thereafter, cooling the substrate;

(d) thereafter, flowing an etchant gas into the process chamber;

(e) thereafter, providing a second gaseous mixture to the process chamber, the second gaseous mixture comprising a second deposition gas and a second inert gas source; and

(f) generating a second high-density plasma from the second gaseous mixture to deposit a second portion of the film on the substrate.

18. The computer readable storage medium according to claim 17 wherein the second high-density plasma is generated to deposit the second portion of the film with a second deposition/sputter ratio within the range of 5 – 20, wherein the second deposition/sputter ratio is defined as a ratio of a sum of a second net deposition rate and a second blarket sputtering rate to the second blanket sputtering rate.

19. The computer-readable storage medium according to claim 17 wherein the dielectric film is to be deposited over a plurality of stepped surfaces formed on the substrate having gaps formed between adjacent ones of the stepped surfaces and wherein the first portion of the film partially fills the gaps.

20. A substrate processing system comprising:

(a) a housing defining a process chamber;

(b) a high-density plasma generating system operatively coupled to the process chamber;

(c) a substrate holder configured to hold a substrate during substrate processing;

(d) a gas-delivery system configured to introduce gases into the process chamber;

(e) a pressure-control system for maintaining a selected pressure within the process chamber;

(f) a controller for controlling the high-density plasma generating system, the gas-delivery system, and the pressure-control system; and

(g) a memory coupled to the controller, the memory comprising a computer-readable medium having a computer-readable program embodied therein for directing operation of the substrate processing system, the computer-readable program including

(i) instructions to control the gas-delivery system to provide a first gaseous mixture to the process chamber, the first gaseous mixture comprising a first deposition gas and a first inert gas source;

(ii) instructions to control the high-density plasma generating system to generate a first high-density plasma from the first gaseous mixture to deposit a first portion of the film on the substrate with a first deposition/sputter ratio within the range of 5 – 20, wherein the first deposition/sputter ratio is defined as a ratio of a sum of a first net deposition rate and a first blanket sputtering rate to the first blanket sputtering rate;

(iii) instructions to control the gas-delivery system therafter to flow a heat-transfer gas to cool the substrate;

(iv) instructions to control the gas-delivery system thereafter to flow an etchant gas into the process chamber;

(v) instructions to control the gas-delivery system thereafter to provide a second gaseous mixture to the process chamber, the second gaseous mixture comprising a second deposition gas and a second inert gas source; and

(vi) instructions to control the high-density plasma generating system to generate a second high-density plasma from the second gaseous mixture to deposit a second portion of the film on the substrate.

21. The substrate processing system according to claim 20 wherein the instruction to generate a second high-density plasma comprise instructions to deposit the second portion of the film with a second deposition/sputter ratio within the range of 5 – 20, wherein the second deposition/sputter ratio is defined as a ratio of a sum of a second

net deposition rate and a second blanket sputtering rate to the second blanket sputtering rate.

22. The substrate processing system according to claim 20 wherein the dielectric film is to be deposited over a plurality of stepped surfaces formed on the substrate having gaps formed between adjacent ones of the stepped surfaces and wherein the first portion of the film partially fills the gaps.